REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated June 17, 2003. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

Claims 3-10, 15-18, and 20-21 are under consideration in this application. Claims 7-9 and 24-26 were withdrawn from consideration. Claims 3, 7-8 and 15 are being amended, as set forth above in the marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim Applicants' invention.

Additional Amendments

The claims are being amended to correct formal errors and/or to better disclose or describe the features of the present invention as claimed. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Prior Art Rejections

Claims 3-10, 15-18 and 20-21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over an article by Ronaghi et al. (*Science*, pp. 363-365; hereinafter "Ronaghi") and U.S. Pat. No. 6,387,234 to Yeung et al. (hereinafter "Yeung"). This rejection has been carefully considered, but is most respectfully traversed.

The system for obtaining DNA sequence information according to the invention, as recited in claim 3, comprises: at least one reaction vessel; means for supplying at least four different kinds of dNTPs (i.e., dATP, dCTP, dTTP, and dGTP; page 2, lines 28-29) into each reaction vessel 10 via independent capillaries 6 or grooves 13 by pressurizing or by a liquid transfer system; and a detector monitoring synthesis of a strand complementary to a template DNA by detecting chemiluminescence which arises from reaction with ATP and luciferin in the presence of luciferase at the reaction vessel the ATP being converted from pyrophosphate produced from the synthesis which uses the different

kinds of dNTPs. In particular, each of the capillaries or the grooves corresponds to one of said different kinds of dNTPs (e.g., Fig. 2).

The invention, as now recited in claim 15, is directed to a DNA analyzing system comprising: at least one reaction vessel; means for supplying four different kinds of dNTPs into each reaction vessel via independent capillaries or grooves by pressurizing or by liquid transfer system; and a detector monitoring synthesis of a strand complementary to a template DNA by detecting chemiluminescence which arises from reaction with ATP and luciferin in the presence of luciferase at the reaction vessel the ATP being converted from pyrophosphate produced from the synthesis which uses the different kinds of dNTPs. In particular, each of the capillaries or the grooves corresponds to one of said different kinds of dNTPs (e.g., Fig. 2).

The present invention described in claims 3 and 15 is characterized in the system comprising mean for supplying four kinds of dNTP via independent capillaries or grooves by pressurizing or a liquid transfer system wherein each of the capillaries or the grooves corresponds to one of said different kinds of the dNTPs. The characteristics allows obtaining DNA sequencing information or analyzing DNAs.

Applicants respectfully contend neither Ronaghi nor Yeung teaches or suggests "***means for supplying*** four different kinds of dNTPs into each reaction vessel via independent capillaries or grooves by pressurizing or a liquid transfer system while each of the capillaries or the grooves corresponds to one of said different kinds of dNTPs." This characteristic provides a compact, simple, convenient and unique system for obtaining DNA sequencing information or analyzing DNAs (page 4, second paragraph or the original specification).

As admitted by the Examiner on page 9, second paragraph, of the outstanding Office Action, Ronaghi does not teach how the dNTPs are supplied or the use of any capillaries. Ronaghi merely describes that parallel processing of large numbers of the samples can easily be envisioned with the use of microinjector technology. Ronaghi describe that parallel processing of a large number of the samples can easily be envisioned with the use of microinjector technology and the precise delivery of submicroliter volumes of the four nucleotides by "ink-jet" technology into a microtiter plate coupled with simultaneous detection of all samples by a single CCD unit (page 365, middle column, lines 21-31). However, Ronaghi fails to describe any means for supplying four kinds of dNTP via independent capillaries or grooves and how to carry out "microinjector technology" and "ink-jet" technology.

Yeung describes an integrated multiplexed capillary electrophoresis system for the analysis of sample analytes (Abstract). The operation of the integrated multiplexed involves a step of processing the sample by introducing the sample into a chromatographic column array and initiating chromatographic separation of the sample to yield a purified sample after introducing the sample into the capillaries (lines 33-41, Col. 5). The samples are introduced into a plurality of intake capillaries and pumped through the intake capillaries by fluid control of a plurality of first multiplexed freeze thaw valves (lines 1-9, Col. 6). However, Yeung fails to describe any means for supplying four kinds of dNTP via independent capillaries or grooves.

Contrary to the Examiner's allegation on page 10, second paragraph of the outstanding Office Action, that it is obvious for one skilled in the art to supply the four different kinds of dNTPs in Ronaghi via Yeung's capillaries using a pressure control device, a person skilled in the art would in fact not be motivated to combine the teachings in Ronaghi and Yeung in the manner suggested by the Examiner since the resulting change in the principle of operation in Ronaghi will contradict its intended purpose.

In addition, Applicants respectfully point out to the Examiner that any reliance upon the "common knowledge and common sense" of one skilled in the art for the allegedly "inherent" teachings and any motivation for combining the teachings has to fulfill the agency's obligation to cite the positive teachings in the references, e.g., *statements in the prior art*, support its conclusions on the record to allow accountability.

> *To establish a prima facie case of obviousness, the Board must, inter alia, show "some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). "The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved." Kotzab, 217 F.3d at 1370, 55 USPQ2d at 1317. .... Recently, in In re Lee, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002), we held that the Board's reliance on "common knowledge and common sense" did not fulfill the agency's obligation to cite references to support its conclusions. Id. at 1344, 61 USPQ2d at 1434. Instead, the Board must document its reasoning on the record to allow accountability. Id. at 1345, 61 USPQ2d at*

1435.

See In re Thrift, 298 F.3d 1357.

Such an obligation to provide specific teaching(s) also applies to any existing or future obviousness rejections.

Even if, arguendo, a person of ordinary skill were motivated to combine the teachings in Ronaghi and Yeung, such combined teachings would still fall short in fully meeting the Applicants' claimed invention as set forth in claims 3 and 15 since, as discussed, there is no teaching of "*means for supplying* four different kinds of dNTPs *into each reaction vessel* via independent capillaries or grooves by pressurizing or a liquid transfer system while each of the capillaries or the grooves corresponds to one of said different kinds of dNTPs" in either Ronaghi or Yeung. Both Ronaghi and Yeung are silent about the above-mentioned characterizing feature of the present invention, i.e. mean for supplying four kinds of dNTP via independent capillaries or grooves by pressurizing or a liquid transfer system wherein each of the capillaries or the grooves corresponds to one of said different kind of the dNTPs. As a matter of course, the cited references fail to suggest the characterizing feature of the present invention, and do not contain slightest idea to motivate similar approach. This characterizing feature leads to surprising effects, i.e. obtaining DNA sequencing information or analyzing DNAs.

Accordingly, Applicants contend that the cited conflicting teachings of the prior art references would not motivate their combination such that their combination would embody each and every feature of the present invention as now claimed in claims 3 and 15 from which claims 4-10, 16-18, and 20-21 depend. The difference is more than sufficient that the present invention as now claimed would not have been rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable, over the prior art.

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely, Applicants respectfully contend that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of

the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

Respectfully submitted,

Stanley P. Fisher
Registration Number 24,344

Juan Carlos A. Marquez
Registration Number 34,072

REED SMITH LLP
3110 Fairview Park Drive, Suite 1400
Falls Church, Virginia 22042
(703) 641-4200

September 8, 2003
SPF/JCM/JT